Senrigan GP-35 Brushless Gimbal Instruction Manual

AlexMos Version

(1 Mar 2014)

Contents

1. Introduction:

Brushless Gimbal is the next generation technology for high quality aerial photography. Senrigan GP-35 Brushless Gimbal is driven directly with two Brushless Motors for two axis movement roll and tilt without gears or belts. The main advantages of this design compared to traditional actuators (servos) are the Brushless Gimbals have no backlash in the gear or belt, and it provides the instantaneous response to the disturbance. Due to lack of gears/ belts, this new Brushless Gimbal is extrenely easy to install and with low weight which is perfect for aerial activities. The lower the weight, the longer the flying time you can achieve.

Differ than others, the motors and Gimbal Controller of Senrigan GP-35 Brushless Gimbal have been well test and tuned of the PID parameter for GoPro 3 Cameras in the factory before selling. So no worries about the setting or PID tuning of the Brushless Gimbal. Furthermore, GP-35 is designed to full fit DJI Phantom Quadcopter with only two screws easily. There is no modification needed at all when using with GP-35. So this is suitable for both beginners as well as professionals.

Last but not the least, GP-35 Gimbal comes with an AV Output cable which allows GoPro 3 camera to transmit the video signal down to the ground by using an FPV system(not included). So that you will see what you are exactly recording. At the same time, GP-35 has the newer Brushless Gimbal firmware installed which enable 90 degree tilting. This is very useful for professional aerial filming and FPV flying activities.

Features:

-Direct drive of Brushless Motors for both Roll and Tilt axis.

-Full fit to DJI Phantom Quadcopter without any modification.

-Simple and strong Mechanism Design.

-Made of CNC Metal Parts and Fiber Frames which is super light and strong.

-Super Steady Performance with high quality Rubber Tension Damper Balls.

-High Quality Brushless Gimbal Controller(Pre-programmed) with the most steady performance.

-Well tested and PID parameter tuned by the factory for GoPro 3 camera.

-Included an high quality AV signal output cable for Gopro 3 Camera.

-Controllable Roll and Tilt(Max. 90 degree) Axis Movement.

-Easy to install and use.

-Compact, light and valuable.

Specification:

-Movement: 2-axis, Roll and Tilt

-Controllable axis: Tilt 90 Degree, Roll 60 Degree

-Working Voltage: 3S 11.1V Lipo

-Brushless Gimbal Controller Weight: 16g

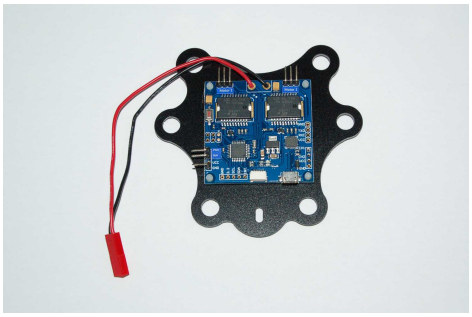
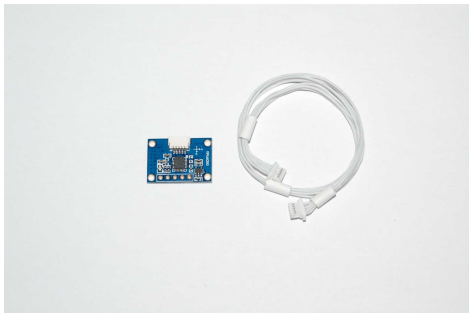
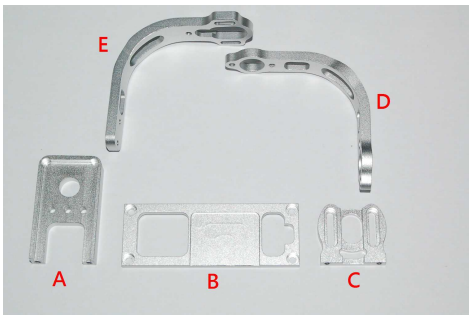
-IMU Weight: 1.4g

-Brushless Gimbal Motor Weight: 47.7g /Pcs

-Total Weight with Gopro 3 Camera: 270g

2. Check List

Please Check the Follow parts.

		
BL Gimbal Controller with Top Mounting Frame 1pcs	IMU Unit with Soft IMU Cable 1pcs	New BL Gimbal Motor 2208 2pcs
		
CNC Metal Parts: A: Side Camera Cover B: Upper Camera cover C: Motor Mount D: Front arm E: Rear arm	Lower Damper Plate – 1pcs	Rubber Tension Damper Balls 6pcs
		
AV Cable for Gopro-3 1pcs	Tilt and Roll Controlling Connector 1pcs	JST Male Connector 1pcs

		
Silver Hex Cap Screw M2.5x6mm 4 pcs	Silver Philip Screw – 2pcs Nylon M3 Nut – 4pcs	Screw Pack: M2.5x6mm Hex Cap Screw – 8pcs Black Philip Screw – 2pcs M3 Set Screw – 3pcs

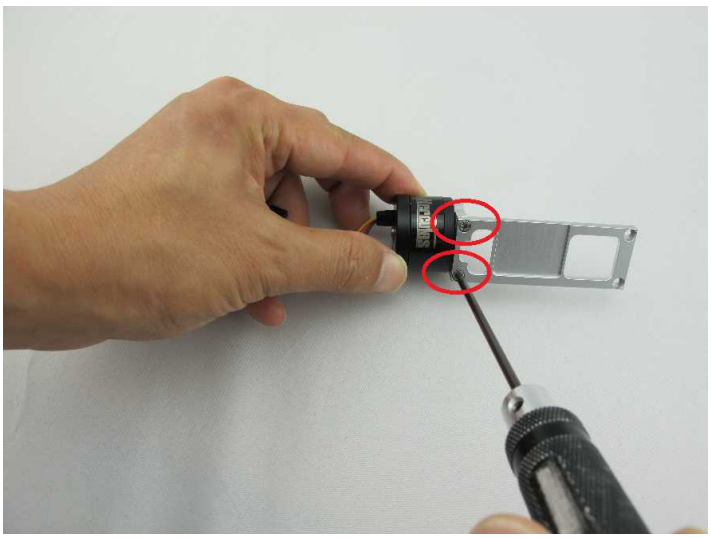
3. Equipment Required For Assembly

	
1pcs Gopro3 Camera	1 complete set of DJI Phantom (Important: Before install GP-35 Gimbal on your Phantom, make sure it is flying properly with minimum vibration. Otherwise the Gimbal may not work properly and stably!)

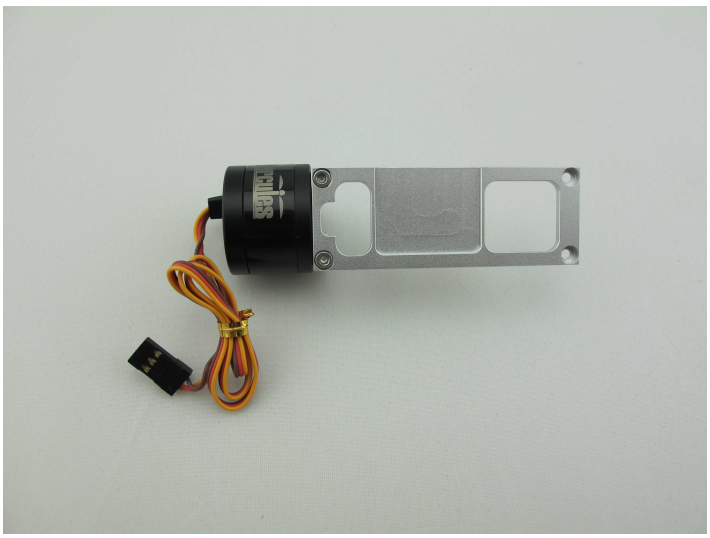
4. Assembly Steps – Mechanism Parts

Step 1.
Recognize the oriantation for the BL Gimbal Motor.

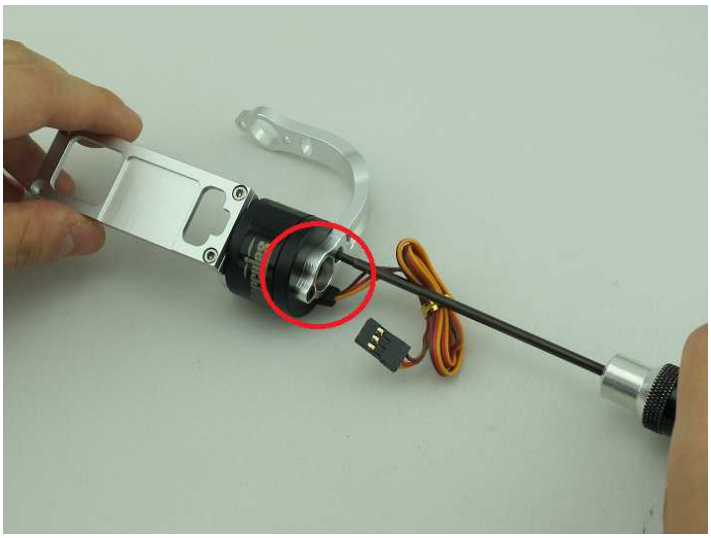
Step 2.
Install a Motor Mount onto the Front Side of BL Gimbal Motor using M2.5x6mm Hex Cap Screws which is included with the motor. This is the Tilt Axis.
(Apply little amount of Thread Locker when securing screw to metal parts.)



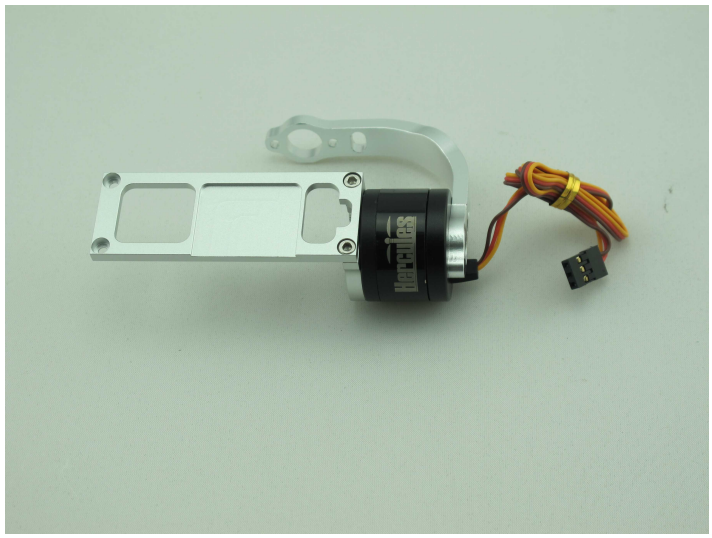
Step 3.
Install the Upper Camera cover onto the Motor Mount using Silver Hex Cap Screw M2.5x6mm.
(Apply little amount of Thread Locker when securing screw to metal parts.)



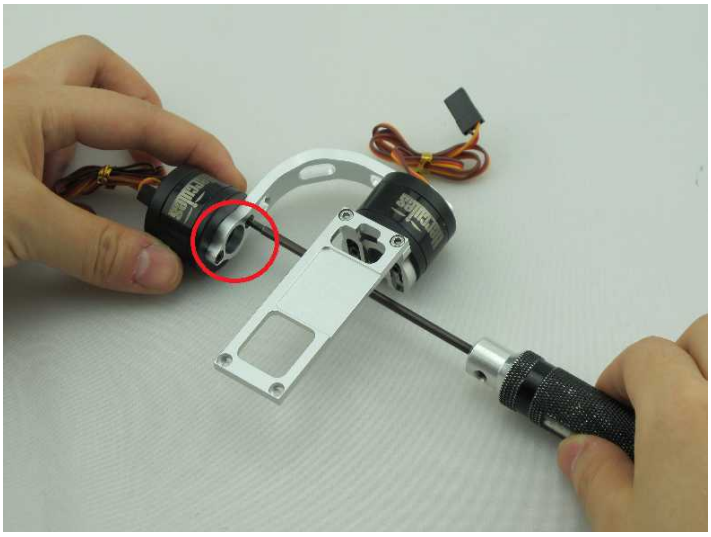
Sep 4.
Complete assembly.



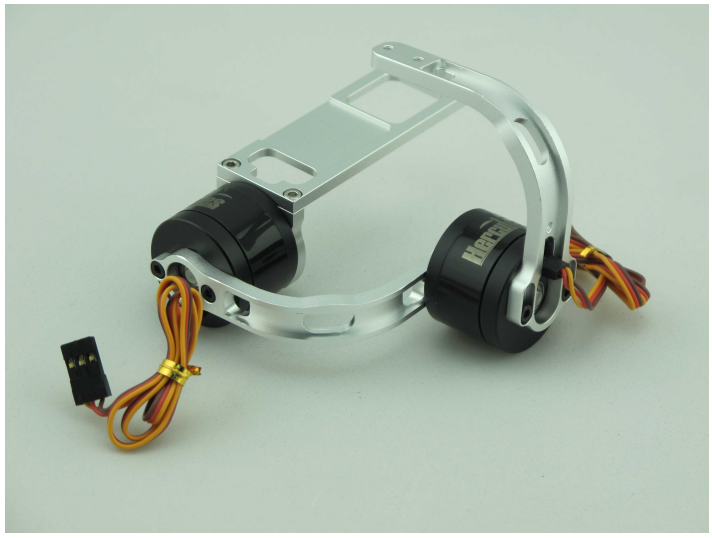
Step 5.
Install the Front Arm onto the Back Side of BL Gimbal Motor using M2.5x6mm Hex Cap Screws which is included with the motor.
(Apply little amount of Thread Locker when securing screw to metal parts.)



Step 6.
Complete assembly.

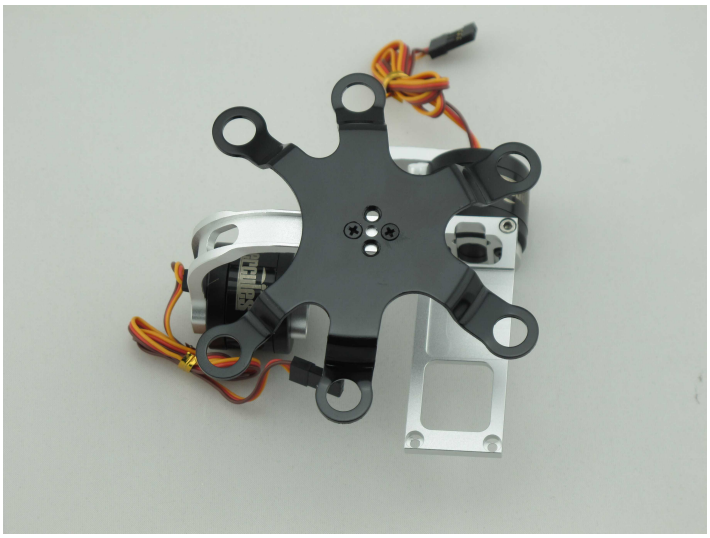


Step 7.
Install the Front Arm onto the Front Side of BL Gimbal Motor using M2.5x6mm Hex Cap Screws which is included with the motor.
(Apply little amount of Thread Locker when securing screw to metal parts.)

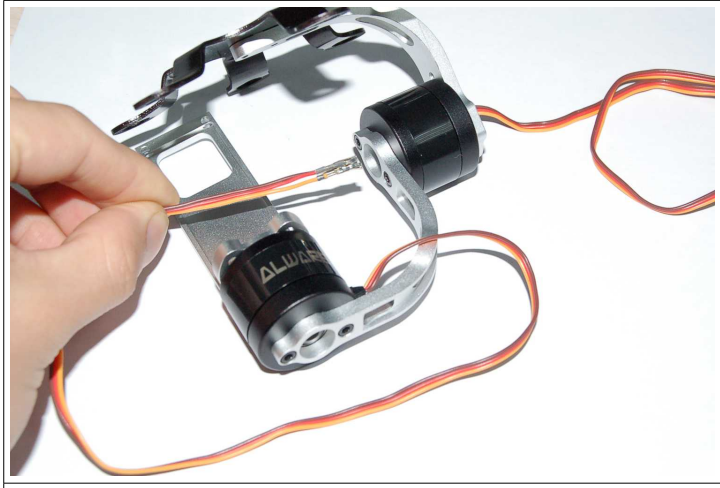


Step 8.
Complete assemblly.

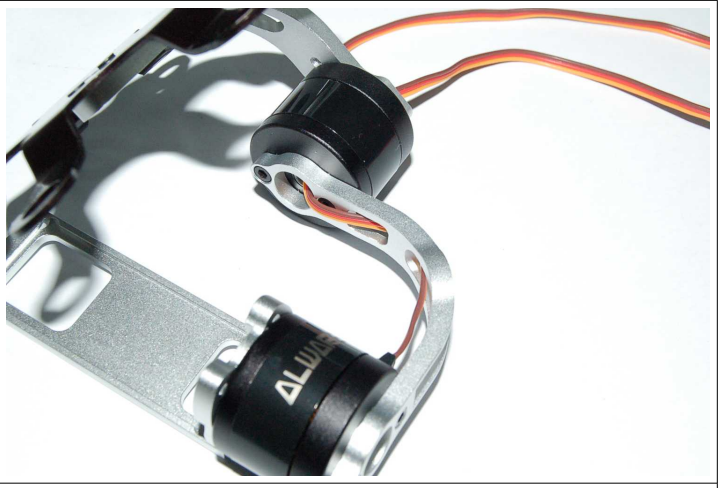
Step 9.
Install the Lower Damper Plate onto the Rear Arm using Black Philip Screws. Pay attention to the installation direction of the Lower Damper Plate.
(Apply little amount of Thread Locker when securing screw to metal parts.)



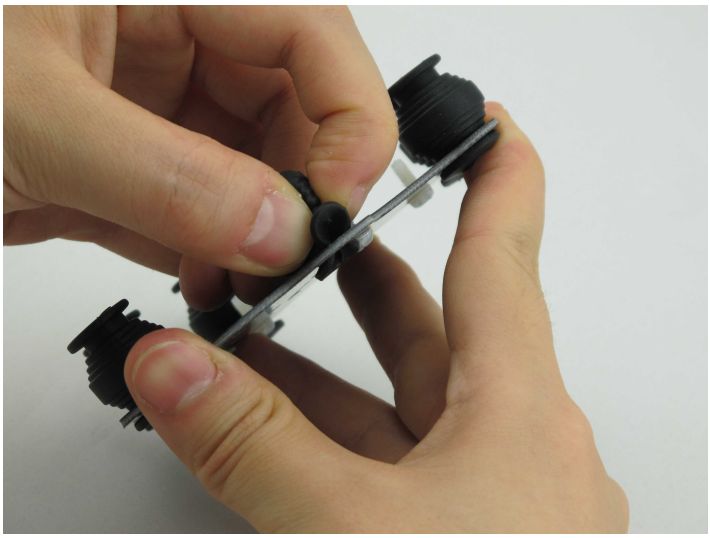
Step 10.
Complete assembly.



Step 11.
Insert the cable of the Tilt Motor into the hole of the Roll motor.



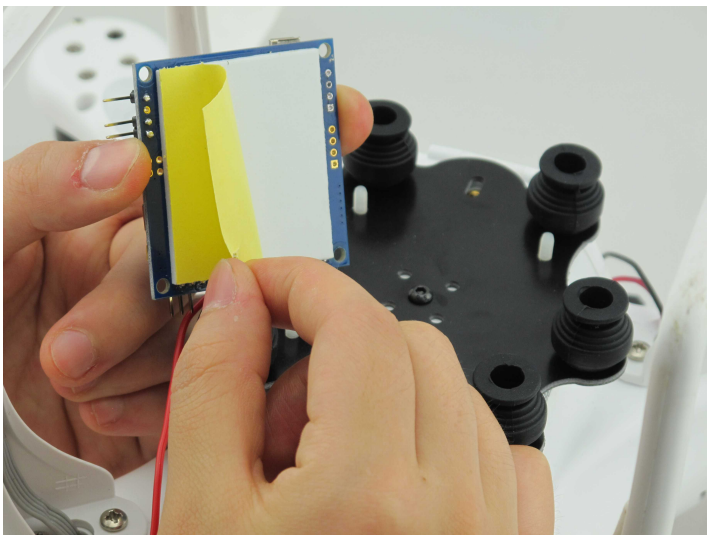
Step 12.
Close view for the wiring of the Tilt motor.



Step 13.
Insert 6pcs Rubber Tension Damper Balls into the holes of Top Mounting Frame.

Step 14.
Complete assembly.

Step 15.
Install the Top Mounting Frame onto the bottom side of Phantom using 2pcs Silver Philip Screws.
(Apply little amount of Thread Locker when securing screw to metal parts.)

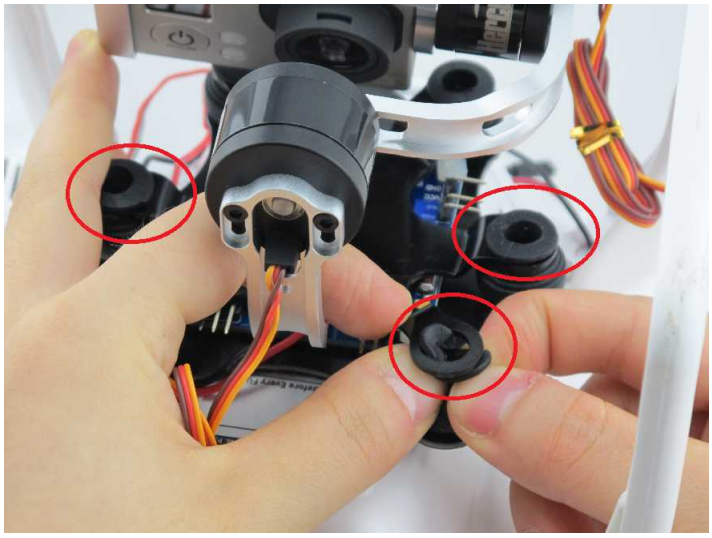


Step 16.
Remove the cover layer of the foam tap on the BL Gimbal Controller.

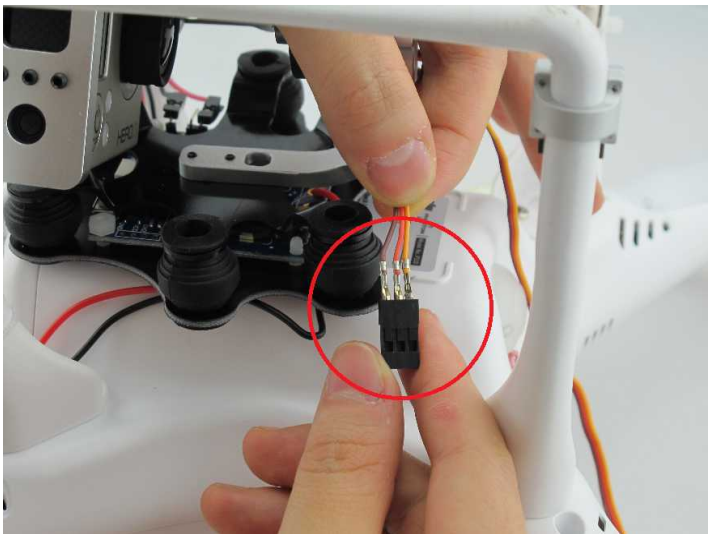
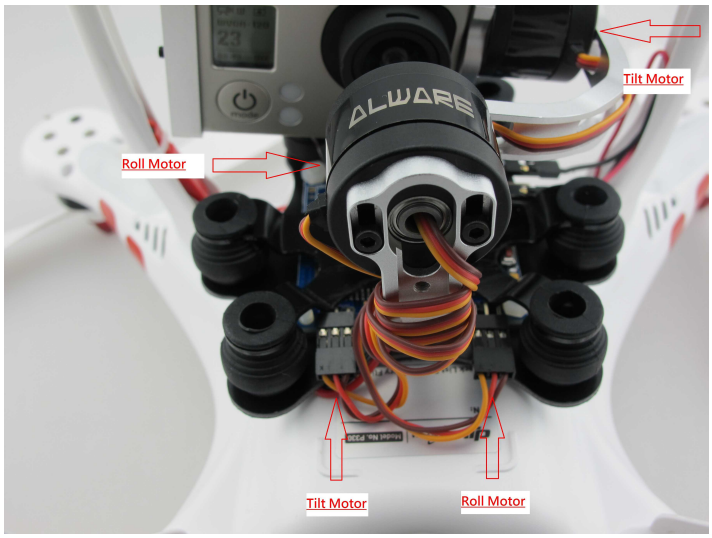
Step 17.
Stick the BL Gimbal Controller board on the Top Mounting Frame and secure it with 4pcs Nylon M3 Nuts. (Tighten the Nylon Nuts completely.)

Step 18.
Install the Gopro 3 camera onto the Upper Camera cover using the Side Camera Cover and secure it with 2pcs Silver Hex Cap Screw M2.5x6mm.
(Apply little amount of Thread Locker when securing screw to metal parts.)

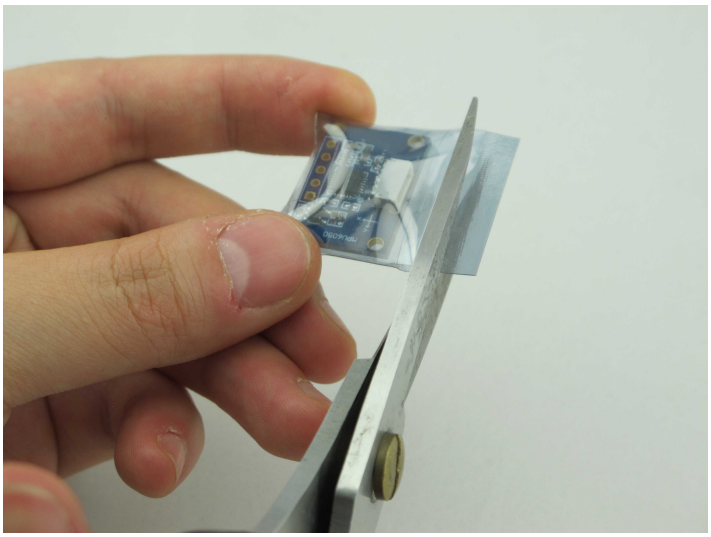
Step 19.
Complete assembly.



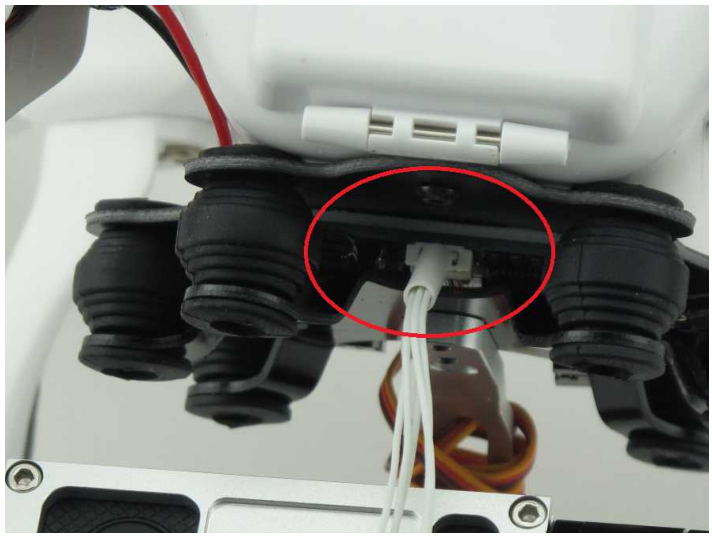
Step 20.
Connect the gimbal mount with 6pcs Rubber Tension Damper Balls.

	
Step 21. Insert the Motor Cables of Tilt and Roll Motors into the Connector Cases included. Pay attention to the position of each color of wires.	Step 22. Connect the Titl and Roll Motors onto the Gimbal Controller Board. Follow the connect direction as shown above.

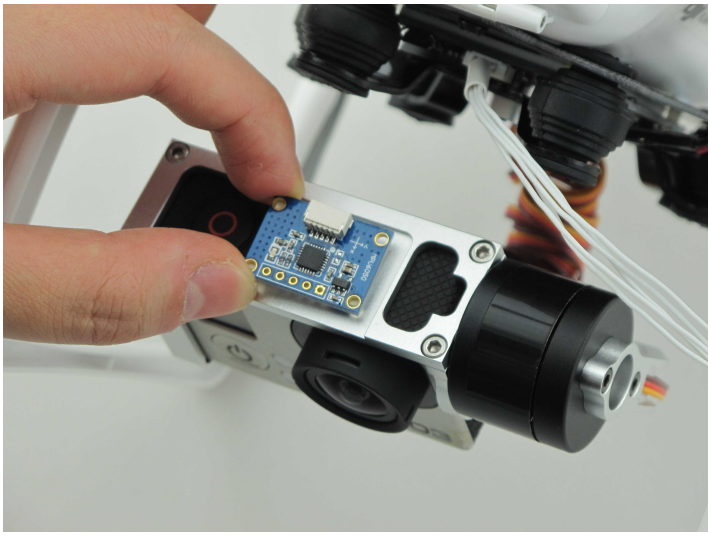
5. Assembly Steps – IMU Mounting



Step 1.
Prepare the IMU Unit.



Step 2.
Connect one end of the IMU Cable onto the IMU port of the Gimbal Controller Board.

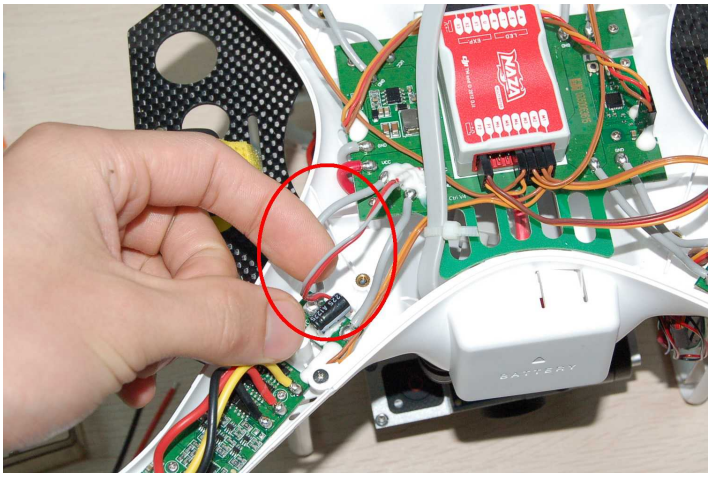


Step 3.
Stick the IMU Unit onto the Upper Camera cover using double-sided foam tape. Check the double faced adhesive tape regularly to ensure that the IMU is securely positioned. *(Ensure the orientation of the IMU is installed correctly.)*

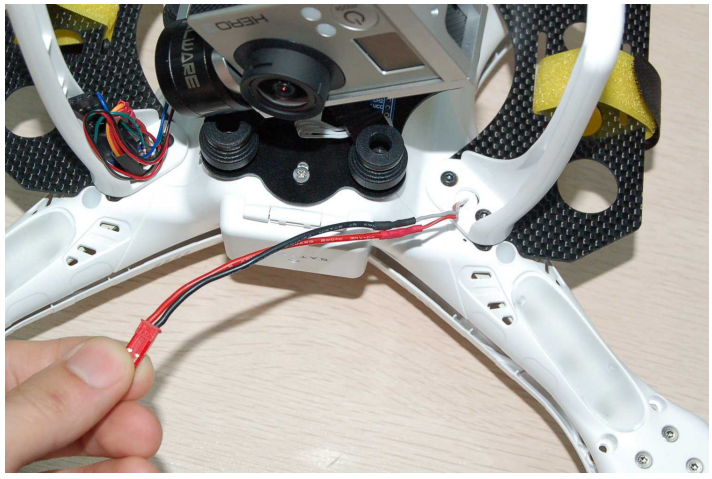
Step 4.
Connect the other end of the IMU Cable into the IMU unit.

	
Step 5. Front view of GP-35 assembly.	Step 5. Side view of GP-35 assembly.

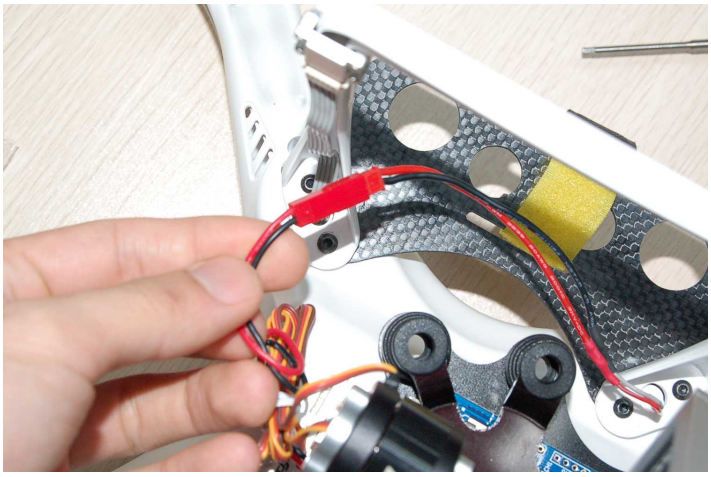
6. Assembly Steps – Power Connection and Manually Tilting



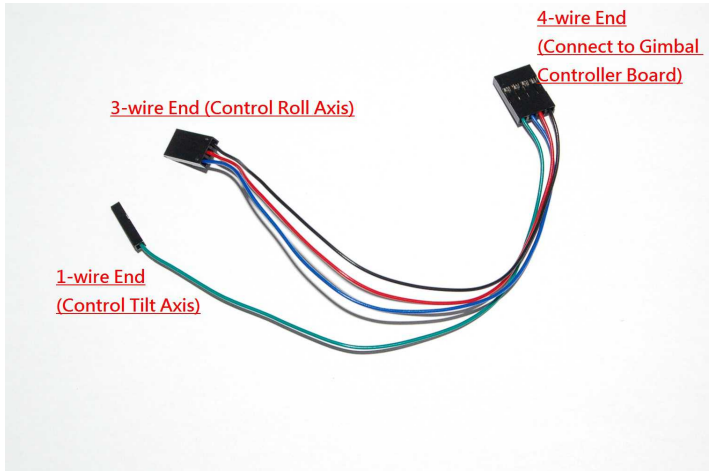
Step 1.
Take off the Top cover of your Phantom. Please refer to the manual of DJI Phantom.
Make sure the Power cable in the Phantom is passing through the casing.



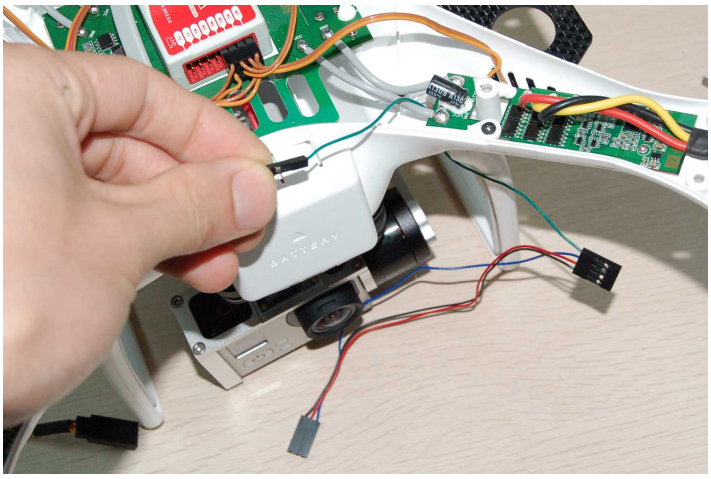
Step 2.
Solder the Male JST Connector to the Power cable of the Phantom. (Important: Solder Red to red wire, and black to brown wire!)



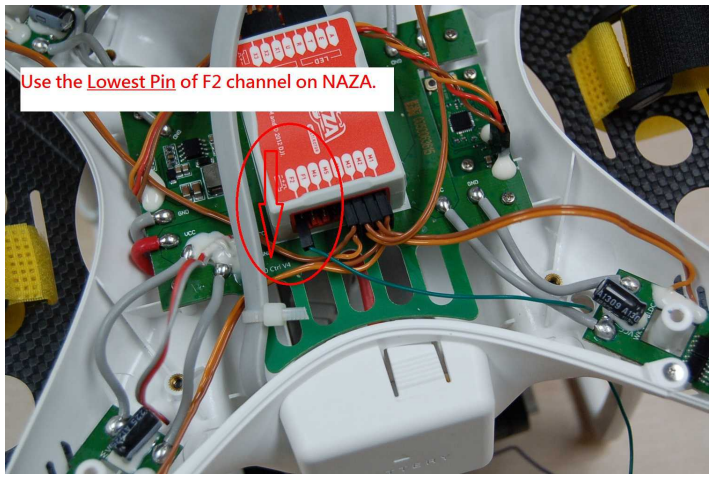
Step 3.
Connect the JST connectors to the Gimbal Controller Board.



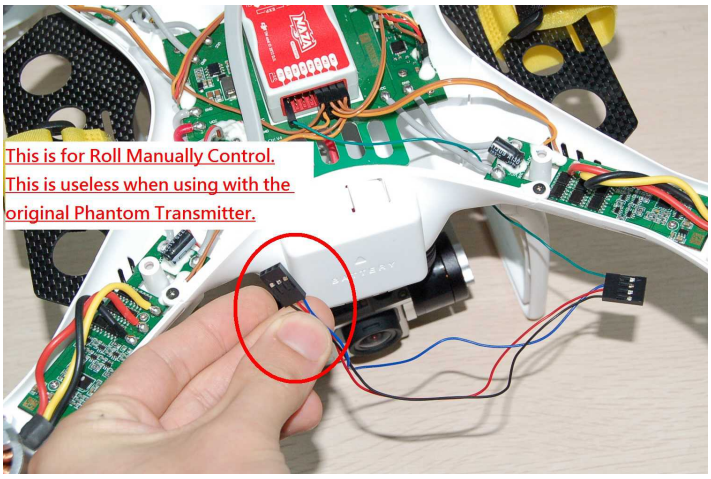
Step 4.
Name for each end of the Tilt and Roll Controlling Connector.



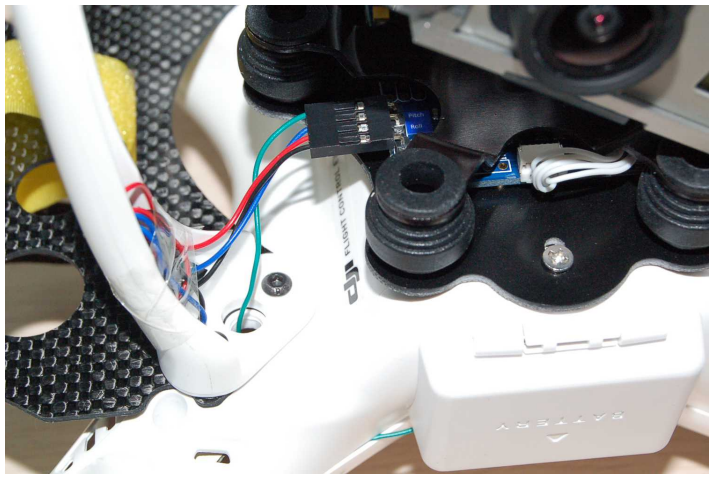
Step 5.
Insert 1-wire End connector of the into the casing of the Phantom.



Step 6.
Insert the 1-wire End connector into F2 port of NAZA controller in the Phantom. (Pay attention to the position (use the Lowest Pin) of the connector.)



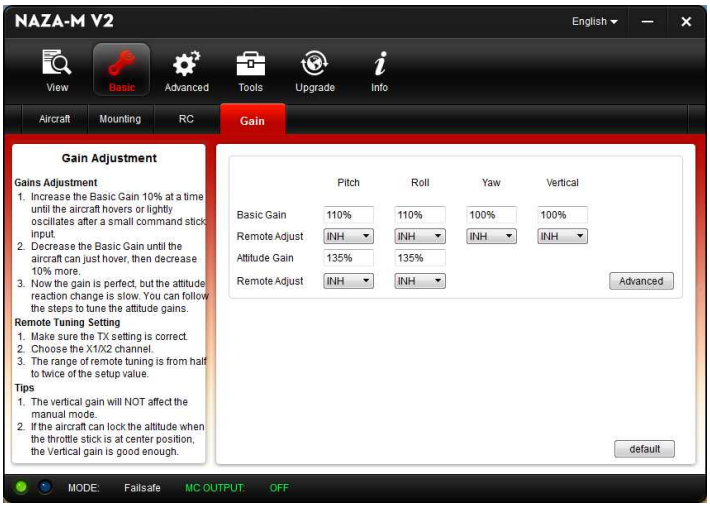
Step 7.
Please be noted that the 3-wire End connector is useless when using the original Transmitter of Phantom. You can just fix this connector on the landing gear of Phantom for better appearance.



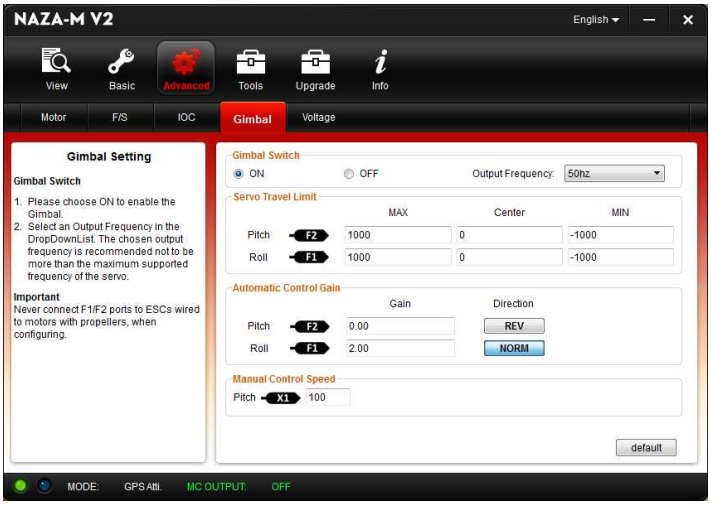
Step 8.
Connect the 4-wire End connector to the Gimbal Controller Board. (Pay attention to the direction.)
Cover the Top Casing back to Phantom and now is ready to setup the Gimbal Tilt control with the Assistance Software of Phantom (NAZA).

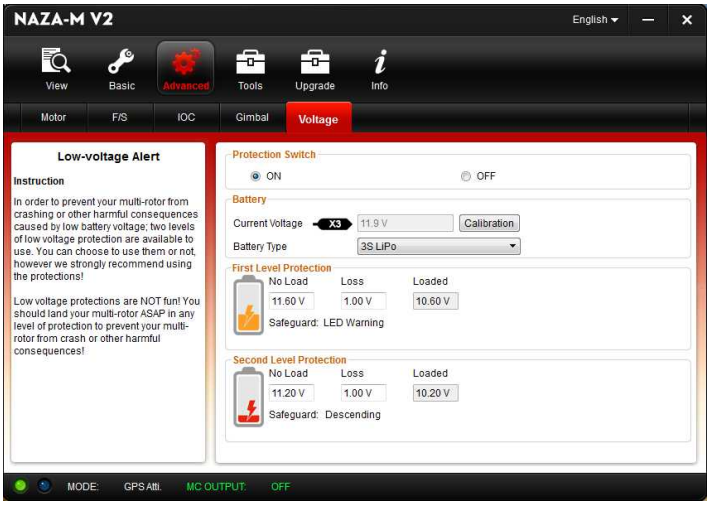
7. Assembly Steps – Setup Manual Tilting on NAZA

Step 1.
Turn on the Transmitter and then power on the Phantom. Then connect Phantom to the computer with DJI Assistance Software. (For more details, please refer to the manual of your Phantom.)



Step 2.
You can take this Gain values as reference if needed. (You may need to adjust these values according to your own situation.) The value of Pitch and Roll gain must be lower than 110 so that the gimbal will work with minimum vibration.





Step 3.
Setup the Gimbal function of your Phantom as shown above as to control the Tilt axis of GP-35 Gimbal with original Phantom Transmitter.

Step 4.
This is for reference only. (You can adjust these values according to your own situation.)

	
Step 5. You will use the additional Channel on the back of Phantom's transmitter to control the Tilt Axis of GP-35 Gimbal. You can use or DIY a flat rod to control this channel, or you can order the **DJI Phantom Upgrade Kit** in the near future.	Step 6. Or you can add the **DJI Phantom Upgrade Kit** in the near future. (This is optional.)

8. Power On Steps

Before Power On the Gimbal:

1. Please check the polarity of the JST connectors.

2. Make sure the IMU is installed on top of the Upper Camera Cover correctly.

Refer to IMU Mounting section.

3. Use only 3S 11.1V Lipo Battery for your Phantom.

4. The Brushless Gimbal Controller has been tuned perfectly to plug-n-play with GoPro 3 camera on Phantom.There is no additional tuning needed.

Follow the following sequencies to power on your Senrigan-GP-35 Brushless Gimbal correctly.

Step 1.

Turn on your Phantom's Trnsmitter.

Step 2.

Power on the Phantom with 3S 11.1V Lipo Battery. Keep the whole machine steady when power on and wait for around 5 seconds for the Phantom and the Gimbal to performance the initialization.

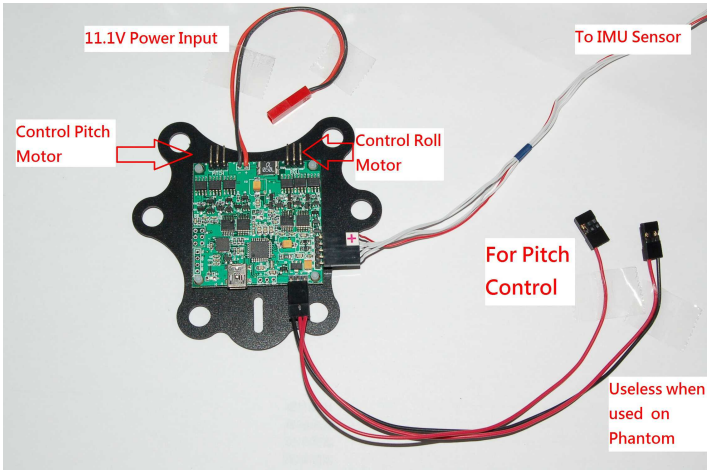
Step 3.

If the initialization step is successful, GP-35 Gimabl will level the Gopro 3 Camera slowly for both Tilt and Roll axis. Otherwise power cycle the system and try again.

Step 4.

Ready to go.

9. Alexmos Control Board Connection and Tuning



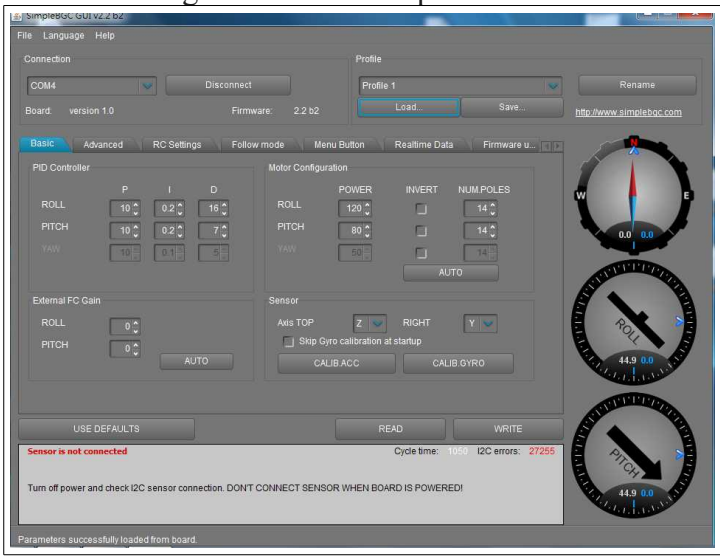
Updated Wiring Diagram for Alexmos Controller Board

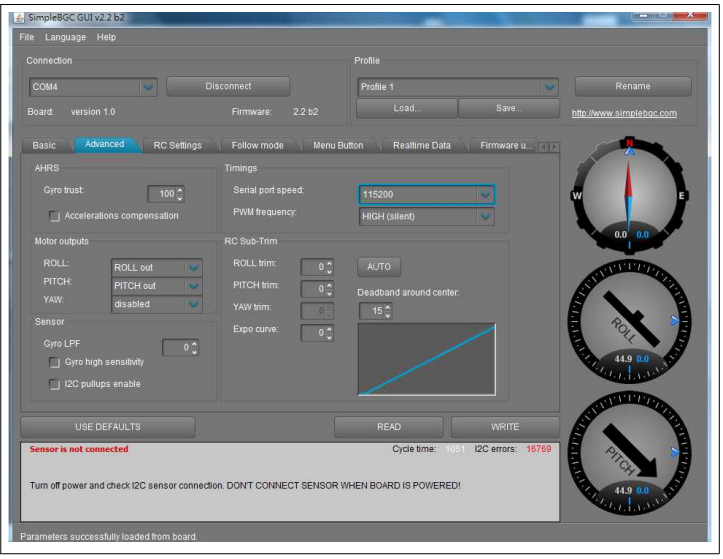
Specification for the Simple Brushless Gimbal Controller with GP-35 Gimbal:
Board: version 1.0
Firmware: 2.2 b2
Tuning Software: SimpleBGC GUI 2.2b2
GP-35 included Licensed BaseCam SimpleBGC Controller
(Starting from version 2.1, firmware upgrade is possible from GUI.)

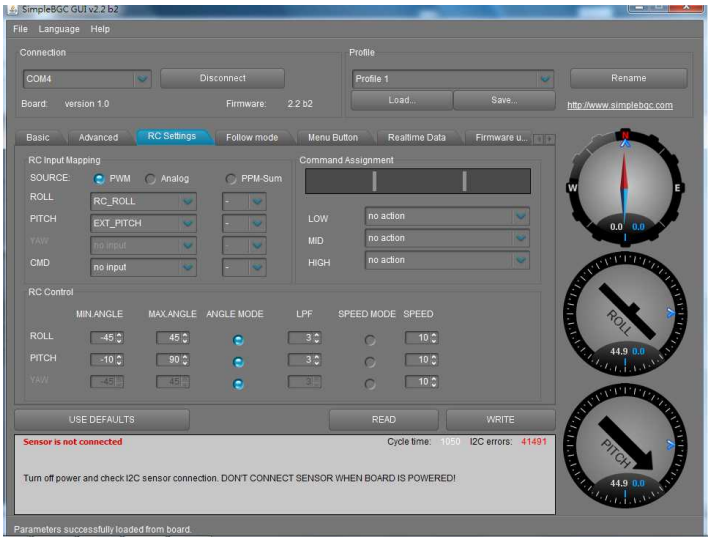
Alexmos websize dowlond 2.2b2
http://www.basecamelectronics.com/files/v10/SimpleBGC_GUI_2_2b2.zip

User manual: SimpleBGC_manual_2_2_eng.pdf
http://www.basecamelectronics.com/downloads/

Default Setting of GP-35 for Gopro 3:






SimpleBGC GUI v2.2 b2
File Language Help
Connection
COM4
Disconnect
Board: version 1.0
Firmware: 2.2 b2
Profile
Profile 1
Load...
Save...
Rename
http://www.simplebgc.com
Basic
Advanced
RC Settings
Follow mode
Menu Button
Realtime Data
Firmware u...
RC Input Mapping
SOURCE: PWM Analog PPM-Sum
ROLL RC_ROLL
PITCH EXT_PITCH
YAW no input
CMD no input
Command Assignment
LOW no action
MID no action
HIGH no action
RC Control
MIN.ANGLE MAX.ANGLE ANGLE MODE LPF SPEED MODE SPEED
ROLL -45 45 3 10
PITCH -10 90 3 10
YAW -45 45 3 10
USE DEFAULTS
READ
WRITE
Sensor is not connected
Cycle time: 1050 I2C errors: 41491
Turn off power and check I2C sensor connection. DON'T CONNECT SENSOR WHEN BOARD IS POWERED!
Parameters successfully loaded from board.
ROLL
PITCH

10. Troubleshooting

Q1: Why does the gimbal not stabilize the camera?

A: Please refer to installation and make sure the IMU Unit is installed at right orientation and the motors are connected to the right pins.

Q2: Why is the gimbal shaking?

A: Usually it is caused be wrong IMU facing, please make sure it is facing down. Refer to IMU Mounting section.

Q3. Why is the captured video shaking?

A: Please ensure your Aircraft is well turned with minimum vibration before mounting the Gimbal. Sometimes you may need to balance the props for your Aircraft too.

Q4: Do I need to upgrade to latest version of firmware or adjust any parameters?

A: It is not necessary to upgrade the firmware or adjust any parameters unless further instruction is given. The Brushless Gimbal Controller is well tuned to plug-n-play with GoPro 3 Camera on Phantom to give the best performance.

Q5: Where can I get more help for this product?

A: Please contact our distributors/ dealers for warranty and customer service.

Related Videos could be found on:

http://www.youtube.com/user/alwarerc

End Of Manual